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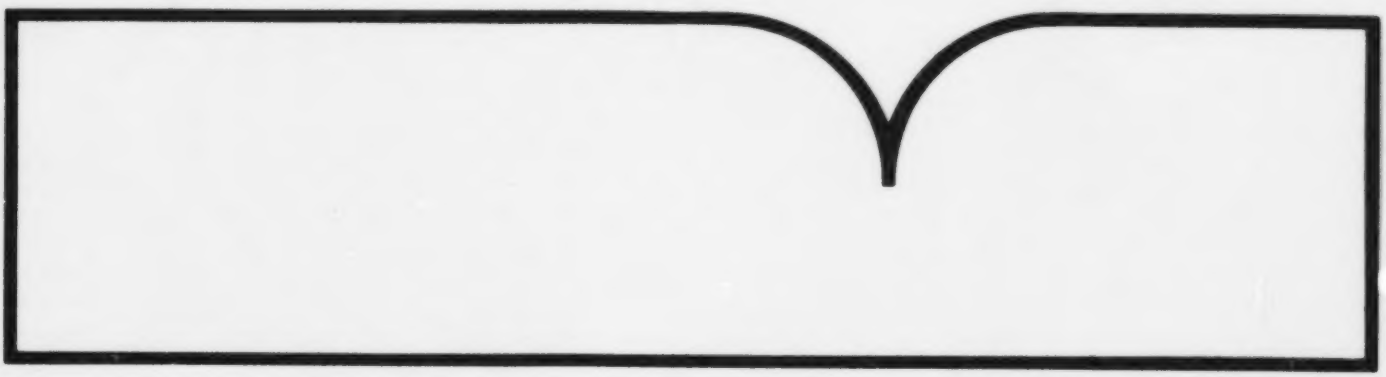
Toxic Substance Storage Tank Containment Assurance and Safety Program
A Containment Assurance and Safety Program for Toxic Materials in Storage Tanks

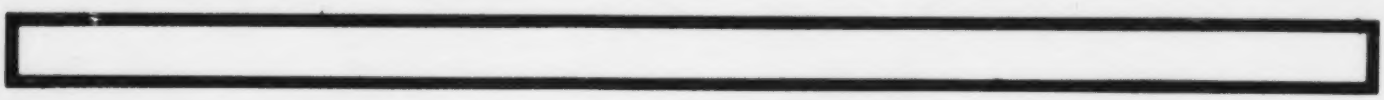
Maryland Dept. of Health and Mental Hygiene
Baltimore

Prepared for

Environmental Protection Agency, Washington, DC

Dec 83





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PB84-177724

TOXIC SUBSTANCE STORAGE TANK CONTAINMENT ASSURANCE AND SAFETY PROGRAM

U.S. ENVIRONMENTAL PROTECTION AGENCY SECTION 28 GRANT TO DEVELOP A CONTAINMENT ASSURANCE AND SAFETY PROGRAM FOR TOXIC MATERIALS IN STORAGE TANKS

CS-807-904-010

MARYLAND DEPARTMENT OF
HEALTH AND MENTAL HYGIENE

STATE OF MARYLAND
DEPARTMENT OF HEALTH AND MENTAL HYGIENE
OFFICE OF ENVIRONMENTAL PROGRAMS
SCIENCE AND HEALTH ADVISORY GROUP

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FINAL REPORT

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The awarding of a Section 28 TSCA grant by the U.S Environmental Protection Agency to the Maryland Department of Health and Mental Hygiene's Office of Environmental Programs through its Science and Health Advisory Group, provided funding for the production of several documents dealing with Containment Assurance and Integrity of Storage Tanks Containing Toxic Materials.

The successful production of these materials, together with their introduction to users and the tank manuafacturing industry at two management seminars, has provided the State of Maryland and other states that will use them, with the necessary information and sources of information for developing and operating effective storage tank safety programs.

This Final Report to EPA summarizes the work done under the grant.

17. Document Analysis a. Descriptors

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Tank Safety
Toxics stored in Tanks
Storage Tank Containment Assurance

b. Identifiers/Open-Ended Terms

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FINAL REPORT

U.S. ENVIRONMENTAL PROTECTION AGENCY SECTION 28 GRANT TO DEVELOP A CONTAINMENT ASSURANCE AND SAFETY PROGRAM FOR TOXIC MATERIALS IN STORAGE TANKS

(CS 807-904-010)

THE SCIENCE AND HEALTH ADVISORY GROUP

THE OFFICE OF ENVIRONMENTAL PROGRAMS

THE MARYLAND DEPARTMENT OF HEALTH AND MENTAL HYGIENE

DECEMBER, 1983

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2. The Training Manual

3. Guidelines for Application of Technical Codes

4. Recommendations for Implementation of a Containment Assurance Program

5. Training Session Script

6. Transcript of Seminar Questions and Answers

ABSTRACT

The awarding of a Section 28 TSCA grant by the U.S. Environmental Protection Agency to the Maryland Department of Health and Mental Hygiene's Office of Environmental Programs through its Science and Health Advisory Group, provided funding for the production of several documents dealing with Containment Assurance and Integrity of Storage Tanks Containing Toxic Materials.

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FORWARD

For the sake of brevity, throughout this report the following abbreviations or acronyms are used:

EPA	=	The U.S. Environmental Protection Agency
OEP	=	The Office of Environmental Programs (DHMH)
DHMH	=	Maryland Department of Health & Mental Hygiene
SHAG	=	Science and Health Advisory Group (OEP)
E & E	=	Ecology and Environment, Inc.
MOSH	=	Maryland Occupational Safety & Health Admin.
DNR	=	Maryland Department of Natural Resources

* * * * *

We are indebted to the good offices of K. K. Wu, Project Manager for the EPA on this grant. Mr. Wu was always available for our questions and concerns, and proved a willing ear when problems arose.

We also wish to acknowledge the expertise and tireless dedication of the Project's Advisory Committee, who made the actualization of the finished project, in large part, possible. These persons were:

Andrew Alcarese, MOSH

Donald Andrew, Air Management, OEP

John J. Barranger, Maryland Casualty Company

John Bender, Office of the State Fire Marshal

William Burgess, Water Resources Administration, DNR

David Healy, Waste Management Administration, OEP

Frank Henderson, Waste Management Administration, OEP

John E. McQuade, Jr., SHAG, OEP

Othniel Thompson, SHAG, OEP, Chairman

Edwin C. Weber, Water Resources Administration, DNR

Carl York, Air Management Administration, OEP

* * * * *

Acknowledgement should also be made to Max Eisenberg, Ph.D., Director of Science and Environmental Health, OEP, Director of SHAG, and also a member of the Governor's Council on Toxic Substances which provided advice and encouragement.

Finally, E & E deserve recognition for the excellent group of documents they developed as the primary outgrowth of the grant program.

INTRODUCTION

SHAG is a unit that is particularly suited to carry out the task of developing a containment assurance program for hazardous materials held in storage tanks.

An outgrowth of the former Toxic Substances Control Program, within what was then known as the Environmental Health Administration, SHAG has been the designated watchdog for OEP in a prospective sense. That is, it is primarily a research-oriented group whose thrust is program development. To that end, it has been engaged in undertaking projects which have not been done before in Maryland, thus making it a forward-looking group, as opposed to a remedial one.

It was because of this, and its experience in this type of endeavor over the last several years, that EPA elected to grant SHAG funds to study the problem. That the program has been carried to a successful conclusion attests to the wisdom of EPA's choice.

Add to this the fact that the results of the program have a high degree of transferability make the grant's purpose viable wherever toxic materials are stored in tanks.

HISTORICAL ORIGIN OF THE INITIAL PROPOSAL

Although many persons in "high places" realized early-on that the problem of toxic substances, be they air emissions, leaks, spills, illegal disposal or any combination of the above were reaching critical proportions, real **public** awareness of the danger was not aroused until the Kepone problem surfaced in Hopewell, Virginia. The spread of that substance from the James River to the Chesapeake Bay evoked a response in Maryland which gave origin to the Toxic Substances Control Group. After EPA, Virginia and Maryland began to take hold of the problem, and after a reduction of kepone in aquatic life was seen in sampled fish, there were still several hundred drums of the substance stored near a branch of the Patapsco River in Baltimore, the Patapsco being a major tributary of the Bay. Complex and comprehensive actions were taken to assure that this material remained contained in its highly-secured storage area, and a collective sigh of relief was breathed when the material was finally shipped to a secure, deep salt mine in Western Germany. That was on December 1, 1978.

On the night of January 4, 1978, as the result of a leak from a storage tank at a large, local manufacturing plant, a cloud of sulfur trioxide was released, nearly causing the evacuation of a large number of persons who lived in its path. Had there not been a fairly heavy breeze that night, the real potential existed for a disaster of no mean significance.

In July of 1979, an initial report revealed that there were toxic chemicals, perhaps PCB-laden oil, stored in tanks in an apparently abandoned area of Sharpestown, a small community on Maryland's Eastern Shore lying on the north side of the Nanticoke River, another direct tributary to the Chesapeake Bay. In August of 1979, sampling and inspection began. On September 27, 1979, the National Response Team met over the matter, and as a resut of OEP's concern and the National Response Team's concurrence, October 10 of that same year was set as the date for complete removal of the material. With the cooperation of DNR and the United States Coast Guard, the tanks were emptied and the contaminated oils, most containing PCB's were stored in 55-gallon drums in a secure warehouse of the U.S. General Services Administration Depot in Curtis Bay, Baltimore, Once again, these drums were stored very close to the Patapsco River. Ultimately the PCB's were shipped to the EPA operated incinerator in Texas.

Prior to this, the Toxic Substances Control Act had been passed by the 94th Congress and signed into law on October 11, 1976. It was this Act, coupled with our own experience with the Kepone problem that lead to formation of the Toxic Substances Control Group, the forerunner of the present SHAG unit. When the old Environmental Health Administration gave way to the Office of Environmental Programs, so the Toxic Substances Control Group became SHAG.

At the regular session of the Maryland General Assembly in the spring of 1978, House Joint Resolution 89 was adopted, requesting the Department of Licensing and Regulation, the Department of Health and Mental Hygiene and the Department of Natural Resources to conduct a joint study to determine:

"How State efforts to ensure the safety of tanks containing hazardous materials can best be coordinated and how responsibilities in this area can most effectively be assigned;

What standards should be promulgated for the proper design, construction, and maintenance of tanks containing hazardous materials;

What classes of tanks require inspection and at what intervals, considering the size, type and location of the tanks, the types of hazardous materials contained in them, and other relevant factors; and

How safety standards can be enforced most effectively . . . ."

It was in response to the General Assembly's request, and all the other incidents leading up to that request, that ensued in the application to EPA for funds for this purpose.

In May of 1980, SHAG submitted a proposal to EPA requesting funds for several toxic substances control measures, and it was out of this initial request that SHAG received and responded to an EPA Request for Proposal (RFP) dealing with containment assurance and integrity of toxic materials stored in tanks. The "Tank Project" grant was awarded in May, 1981, and its completion is the subject of this final report.

JUSTIFICATION FOR FUNDS AND GRANT AWARD

The purpose of the Containment Assurance and Safety Program, as conceived by SHAG, is to protect health, life, resources and property, through the prevention and control of unauthorized discharges of hazardous materials. To assure attainment of this objective, a uniform program of containment assurance and safety practices should be implemented throughout the State. As envisioned originally, the program could be devised in several phases of complexity, consisting of:

- Development and dissemination of guidelines and procedures for the proper storage of hazardous materials.
- Design of industrial self-monitoring and inspection programs.
- Establishment of a State-monitored inspection and monitoring program to assure compliance with the guidelines.
- Promulgation of a comprehensive permitting and regulatory program for hazardous materials containment assurance.

Obviously, the development and implementation of the last three phases would be dependent upon the development and dissemination of the first, and it was to this first phase that the bidding invitation was issued.

The first objective was to design a procedure to assure the containment of toxic and hazardous substances in storage tanks. this required the production of a **Guide and Procedures Manual**, which mandated that a study be made to determine which tanks should be included for consideration, the frequency with which maintenance and inspections be conducted and procedures which are appropriate for the various tanks.

The result of this study would produce a prepared guide available to the industry for the purpose of the development of maintenance, inspection and emergency procedures, including the training of personnel in these areas. This would enable OEP and other State agencies to achieve greater uniformity in the implementation of containment assurance procedures, and a reduction in the frequency and severity of incidents related to toxic substances storage tank failures. The essentials of the RFP are as follows:

I. Production of a Guide and Procedures Manual for the design of containment assurance procedures for toxic storage tanks, detailing maintenance, inspection and emergency initiatives. This Guide and Procedures Manual provides:

A. A classification scheme for tanks to be included in Containment Assurance Procedures.

B. Recommendation of scope, method and frequency of tests and inspections, to include integrity tests such as:

1. Radiography using gamma or X-ray.

2. Ultrasonic testing.

3. Spark testing.

4. Eddy currents.

5. Magnetic particle.

C. Criteria for corrective action.

D. Develop standard reporting forms.

E. Development of new, and improvements to existing inspection, test and maintenance activities.

F. Development of secondary containment measures.

G. Development of a generalized scheme for emergency plans for spill-containment and counter measures.

H. Recommendation for improved operating procedures, when present procedures contribute to increased probability of tank failure.

II. Development of training materials and manual to be utilized in conjunction with "Guide and Procedures Manual".

III. Presentation, in cooperation with SHAG, of two seminars informing industry regarding requirements of the Containment Assurance Program. OEP pursued an interagency approach by using the Governor's Council on Toxic Substances to coordinate the development of the Guide and Procedures Manual.

* * * * *

A proposed Schedule of Events was drawn up to give a rough, preliminary timetable by which both SHAG and perspective bidders could operate. This was the initial timetable:

Date	Action Proposed
7/3/81	Development of an RFP
8/11/81	Advertize in Md. Reg., Balto. Sun & Wash. Post
9/10/81	Release RFP
9/30/81	Hold Bidders' Conference
11/18/81	Closing date for bids
11/18/81	Bid Selection Com. set
12/18/81	Oral presentations by bidders
1/25/82	Bids evaluated and selection completed
3/9/82	Selected proposal will be presented for approval by the Toxic Episodes Committee to its parent group, the Governor's Council on Toxic Sub's.
3/10/82	Proposed contract submitted to successful bidder
3/10/82 - 3/22/82	Contract negotiations
3/23/82	Submit signed contract to Dept. of Budget & Fiscal Planning for review
4/1/82	Contract performance begins
12/3/82	Production of Guide and Procedures Manual complete
12/15/82 - 3/31/83	Seminars conducted to inform industry of new requirements developed as a result of this project

Ecology and Environment, Inc., of Buffalo, N.Y., was the successful bidder and began work immediately upon acceptance and approval of the signed contract by the State of Maryland.

An international known consulting firm, specialists in the environmental sciences, E & E worked diligently to produce the documents and other requirements of the contract so that they would not only apply well in Maryland, but also have that high degree of transferability required by the successful proposal, as set forth in the Toxic Substances Control Act. This is a worthy requirement in these days of crucial projects and short dollars.

While there was some slippage in the schedule as originally set forth, all things considered, E & E has fulfilled the contract and performed well. The slippage has been accomodated through an extension granted by EPA, and this final report will be forwarded to that agency before the extension elapses.

STORAGE TANK ADVISORY COMMITTEE

A significant emphasis in development of the RFP was the need for early appointment of a competent advisory committee to develop needs, monitor commitments and to review submissions. It was also obvious that responsible, that is, relatively highly placed representatives of all the regulatory agencies be involved in the work of the committee as well as in the project from the very beginning. Moreover, it seemed prudent to bring into this group representatives of the State Fire Marshal's Office, the Maryland Occupational Safety and Health Administration and the casualty insurance industry.

To that, end the following persons were appointed to the Committee:

Edwin C. Weber, Chief, Oil Control Division, Water Resources Administration, DNR

William Burgess, Asst. Chief, Oil Control Division, Water Resources Administration, DNR

Andrew C. Alcarese, Senior Industrial Hygienst, MOSH

David Healy, Pulbic Health Engineer, Support Services Division, Waste Management Administration, OEP

Frank Henderson, Chief, Support Services Division, Waste Management Administration, OEP

Donald Andrew, Program Adminstrator, Engineering and Enforcement, Air Management Administration, OEP

Carl York, Chief, Division of Engineering Services, Air Management Administration, OEP

John E. McQuade, Jr., Chief, Division of Environmental Science and Technology, OEP

Othniel Thompson, Chairman, Storage Tank Committee, Tank Project Director, Division of Environmental Science and Technology, OEP

John Bender, Chief Fire Protection Officer, Office of the State Fire Marshal

John J. Barranger, CSP (Certified Safety Professional), Regional Manager, Loss Control Department, Maryland Casualty Company

The Committee met at least monthly - and more often when the need arose - to develop content for the contractor's submissions, review those documents as they were produced, and especially, with the Guide and Procedures Manual, reject the first draft when it revealed some omissions and was at that point unsatisfactory.

The Committee stayed with the project until its culmination at the seminars. Further, the members have been asked to stay on the committee in order to meet from time-to-time for further review of ongoing developments in the tank safety assurance field, and to assist in the future development of whatever Tank Safety Assurance Program is decided upon by SHAG/OEP.

SUBMISSIONS

THE GUIDE AND PROCEDURES MANUAL:

The Guide and Procedures Manual is a very comprehensive document dealing with the many necessary facets of storage tank safety and assurance. It is quite complete, and runs from a section dealing with chemical compatibility through spill control and prevention, and it contains extensive bibliographical references as well as charts, illustrations and tables.

The Introduction, Section 1., deals with the Background of the Tank Safety Assurance Program, citing the danger posed by releases of toxic materials into the environment, the rising incidence of accidental releases and the frequency of faulty construction, poor maintenance and inadequate inspection as the causes of these releases. Objectives of the Containment Assurance Program are listed as utilization of appropriate criteria for storage tank design and maintenance; standardization of preventive maintenance and inspection schedules, training of management, maintenance and inspection personnel in sound practices for hazardous substances control; and providing guidelines for developing a hazardous substances spill prevention program.

The Scope and Application of the Manual is to provide the basic information needed to reduce the likelihood of a hazardous materials storage system failure. It provides information in the form of guidelines for chemical compatibility, tank design and installation, corrosion control, maintenance and inspection, personnel safety and training, and spill prevention and contingency planning. Although the Manual primarily addresses potential problems with hazardous liquids, issues concerning gases and vapors are also discussed.

Section 2 of the Guide and Procedures Manual identifies the major chemical classes and provides a summary matrix of reactions that may occur among them. The section also provides a comprehensive listing of compatibility of specific chemicals and the major materials used in construction of storage tanks and appurtenances. These data will enable inspection personnel to more readily identify undesireable storage operational practices and institute appropriate mitigative measures. Section 3 presents design and installation considerations. These include guidelines for tank selection, ventilation, flammability protection and spill control. Because corrosion is a major problem with regard to storage tanks, corrosion control guidelines are discussed separately in Section 4. Tank maintenance and inspection guidelines are given in Section 5.

These include discussions of testing and inspection procedures for specific types of tanks and appurtenances, recommendations on inspection frequency and criteria for determining the need for corrective action. Safety assurance in toxic substance storage systems is also dependent upon knowledgeable operators. Section 6 of the Manual presents elements of a personnel training program covering the safe operation of hazardous materials storage systems. The section also contains guidelines for safety precautions to be exercised by storage-site personnel, selection of protective and monitoring equipment and a training schedule to meet occupational health and safety standards. To further reduce the possibility of an accidental spill, Section 7 gives the basic elements of Spill Prevention, Control, and Countermeasure (SPCC) plans. The SPCC plans are designed to:

- Ensure rapid and accurate detection of emergency situations;
- Provide methods and procedures to minimize environmental impacts;
- Provide methods and procedures to facilitate efficient recovery and removal of spilled materials; and
- Provide safety measures for response personnel.

The Guide and Procedures Manual is designed to provide a mechanism for the development of hazardous substance containment assurance programs for industrial managers, city planners and permitting agencies, and to be a practical tool for both private industry and public regulatory agencies in establishing workable standards and guidelines for toxic substance storage.

THE TRAINING MANUAL:

While the Toxic Substances Storage Tank Containment Assurance and Safety Program: Guide and Procedures Manual was developed to provide basic guidelines upon which a containment assurance and safety program should be based, the Training Manual was developed to be a companion to the Guide, by providing an introduction to and summary of its contents. Subjects covered in the Training Manual include:

- Chemical compatibility issues;
- Storage system design elements;
- Maintenance and inspection procedures;
- Health and safety issues; and
- Spill prevention and countermeasures.

The Training Manual is NOT designed to be a substitute for the Guide and Procedures Manual, but rather, it is meant to identify areas of key importance, and may serve as the basis for an in-plant training program.

GUIDELINES FOR APPLICATION OF TECHNICAL CODES FOR HAZARDOUS MATERIALS STORAGE TANKS:

This document brings together a listing, by reference, of appropriate technical codes dealing with storage tank design, construction and use, as promulgated by the American Petroleum Institute, the National Fire Protection Association, American Society of Mechanical Engineers, American Water Works Association, American Concrete Institute, the National Association of Corrosion Engineers and the Steel Structures Painting Institute. It further identifies each reference as being either a standard, specification, recommended practice, bulletin or publication, and indicates whether the cited code is applicable to atmospheric, low pressure or high pressure tanks. Certain Underwriters Laboratories codes are also cited.

Because public regulatory agencies derive the data upon which they promulgate restrictive measures from existing standards, codes and recommended practices, the Code document suggests, inferrentially, that the user consult all appropriate and applicable codes, in order to make certain, in advance, that his installation will be in compliance with any legal restriction which could be cited by an inspector.

RECOMMENDATIONS FOR IMPLEMENTATION OF A CONTAINMENT ASSURANCE AND SAFETY PROGRAM:

This fourth document submitted by E & E sets forth how a program to assure the safe containment of toxic substances in storage tanks could be developed and implemented. Several steps to accomplish this goal are listed:

- Dissemination of the Guide and Procedures Manual.
- Dissemination of the Training Manual.
- Dissemination of the Guidelines for Application of Technical Codes for Hazardous Materials in Storage Tanks.
- Solicitation of public comment on these documents and addressing these comments in subsequent editions.
- Development of a suitable data base to document spills from hazardous materials storage tanks.
- Evaluation of the data to determine the magnitude of the problem of containment assurance with regard to hazardous materials in storage tanks.
- Evaluation and formulation of regulatory strategies to solve problems identified by the above.

The first four steps have already been accomplished by Maryland, and the next step is to develop the data base to document spill incidents from hazardous materials storage tanks. This data base should include:

- An inventory of hazardous materials storage tanks in the State.
- A listing of the storage tank types, materials of construction, volumes and contents.
- A description of each tank's appurtenances.
- Detailed accounts of past spills from storage tanks.
- Secondary containment systems employed.
- Operation and maintenance procedures utilized.

Following a comprehensive evaluation of the data, and a determination whether or not additonal level of governmental regulation is needed, the State must decide upon appropriate continuing options, for example:

- No further regulatory action indicated.
- Mandatory self-monitoring system.
- Voluntary program with incentives to encourage compliance.
- Fully mandatory compliance program.
- Combinations of any or all of these measures.

Each of these options is fully discussed together with the necessary steps to put them in operation.

TRAINING SESSION SCRIPT to be used with the TRAINING SESSION MANUAL:

This document is exactly what its title states, a training session script, together with visual aids (35mm slides). The script and slides can be used either with in-house enforcement personnel, or with in-plant safety staff as a very basic training device. It should be used in conjunction with the Guide and Procedures Manual, as well as the Training Manual, around whose collective contents the script was written.

ROLE OF THE GOVERNOR'S COUNCIL ON TOXIC SUBSTANCES

The Governor's Council on Toxic Substances was established by the Maryland General Assembly as a forum of senior representatives from every State agency having regulatory control or interest in toxic and carcinogenic substances. It also has representation from labor, industry, and the Johns Hopkins and University of Maryland medical institutions. Its mission is to advise the Secretary of Health and Mental Hygiene (and hence the Governor), on those concerns which deal with public health and the environment as they impinge on the use of toxic, hazardous and carcinogenic substances.

It reviews impending legislation, presents educational symposia, and provides guidance and coordination to programs, projects and other research-oriented activities for State regulatory agencies, as these activities affect the use of toxic substances.

The Council reviewed the RFP and was provided with timely updates on the progress of the Tank Assurance and Containment grant.

It was available either as a forum for discussion of the project, or as an advisor when the need arose. The expertise of the members was always a welcome resource.

VIDEO TAPE

As an ancillary activity within the grant project, a 15-minute video tape was produced to raise the awareness of the general public to the cross-media intergation needed to control the misuse of toxic substances; the cooperation needed between industry, agriculture, government and the citizenry to abate pollution; and how assurance of the intergrity of storage tanks is one example of cross-media cooperation.

The short documentary was made in cooperation with WBAL Television, Baltimore and the Maryland Center for Public Broadcasting. Extensive use of file-footage from these two broadcasters made production of a very fine, little piece possible for a very small amount of money.

The tape will be shown at a large gathering in Washington, D.C. in early December, dealing with the Chesapeake Bay and its problems/solutions. It will also be available for use by schools, service clubs, school teachers, P.T.A.'s and by other interested groups.

Full credit was given to EPA for the funds to accomplish this important educational adjunct to the tank integrity grant.

SEMINARS FOR THE INDUSTRY

As a final part of this first phase of the grant project, identical seminars were held on Thursday, October 13, 1983 and the next day, at the Holiday Inn at Baltimore-Washington International Airport. Lying nearly midway between Baltimore and Annapolis, and about 30-minutes away from Washington, the Inn provided a reasonably central location and nearby airline accomodations.

Announcements were sent out to manufacturers, users and insurers of storage tanks, and the planners were rewarded with attendance of more than 100 persons the first day and nearly that number on the second. Each attendee received copies of the documents prepared by E & E.

The program consisted of presentations by E & E on the method by which the documents were generated, as well as their contents. A representative of an insurance underwriter explained the various factors entering into the obtaining of insurance for tanks containing hazardous substances. Also, a most interesting part of the program was the presentation by a representative of a large manufacturing company that had had a potentially dangerous release in the Baltimore area in 1979.

The day's activities were concluded by a question and answer session with answers fielded by a panel of experts from EPA, DNR, MOSH, OEP, SHAG, the State Fire Marshal's Office, and the U.S. Coast Guard. These questions and answers were recorded, transcribed and forwarded, to all who attended.

In addition, Mr. Thompson, SHAG's Project Manager, solicited comments on the E & E documents from those in attendance, and those comments will be incorporated in future editions.

CONCLUSIONS

The production and use of the various documents funded by this Section 28 TSCA Grant, made possible through the EPA, we believe will benefit the State of Maryland as it decides upon the best method of implementing the program.

Although they are listed either as "Guides" or as "Guidelines", the documents are quite complete, and with the extensive bibliographies provided, will offer any user all the information or sources of information for state-of-the-art design and operating activities.

Moreover, because of the universality of their approach, the documents have such a high degree of transferability, that their usefulness, nationwide, would appear to be almost limitless.

To these ends, then, the project has been worthwile, useful and of great future potential for preventive measures against environmental degradation and public health risk.

QUESTIONS TO THE PANEL

TANK SAFETY ASSURANCE AND CONTAINMENT SEMINAR

OCTOBER 13, 1983

Day One

QUESTION #1: How does the insurance industry deal with cleanup of toxic substances?

ANSWER #1: (Insurance Representative) Insurance companies deal only with liability occurring off-premises. They do not deal with spills on-premises.

QUESTION #2: What are the limits of liability?

ANSWER #2: (Insurance Representative) There are two kinds of liability-deductible and upper limit of liability. The amount between the upper limit and deductible is what the insurance company is responsible for.

QUESTION #3: Has the insurance industry set up standards for writing liabilities? For example, would the premium be less for a tank 30 years old as opposed to tanks guaranteed for 10 years?

ANSWER #3: (Insurance Representative) Rates are developed at State levels. States determine the rate structure. The underwriter has flexibility within the State's established limits to vary premiums based on the site and circumstances, including equipment design and conditions at the facility.

QUESTION #4: How will the tank industry know of any new regulations developed by the Federal government?

ANSWER #4: (EPA) The Federal government is required to publish notices in the Federal Register informing industry and the public of its intentions.

QUESTION #5: In that vein, so much effort has been put into this program, there should be an effort to make the industries aware of these documents. How will industry be informed of the comment period relating to these documents?

ANSWER #5: (SHAG) Maryland will publish in the Maryland Register notice of the existence of these documents and notice of a comment period, so that at the end of that period as many industries as possible will have the opportunity to submit comments. So far, we have endeavored to advertise the existence of these documents and the plans for these seminars as widely as possible. We sent notices to selected trade journals, sent out press releases, and of course, our invitation list to this seminar has also served as a source of advertisement.

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QUESTION #6: It is my understanding that underground tanks containing hazardous wastes are not covered under any permitting program, how would you define hazardous waste and are petroleum products considered a hazardous waste?

ANSWER #6: (EPA) Petroleum is not a hazardous waste. 40 CFR defines hazardous waste. A hazardous waste is defined as a substance containing at least one of the four following characteristics: Toxicity, Corrosivity, Ignitability, Reactivity.

QUESTION #7: If a 10,000 gallon underground tank contains hazardous wastes, is it included under the permitting program?

ANSWER #7: (EPA) If an underground tank containing a hazardous waste is not provided with a means of entry (manhole) it is not required to be permitted under RCRA. The exclusion is for underground tanks that cannot be entered by an inspector.

QUESTION #8: If you have 2,000 tanks without manholes, where the companies are intentionally trying to avoid obtaining permits, what will EPA do in these cases?

ANSWER #8: (EPA) EPA will address this in the future. Since the majority of underground tanks hold petroleum products, they are not regulated by RCRA anyway.

QUESTION #9: Do you have any feel for the history of underground storage tanks?

ANSWER #9: (DNR) As far as the history of spills, they are increasing. Our experience for the last three or four years indicates that the number of spills may be doubling every year. Of course, this does not include spills being handled by other agencies such as local, other State and Federal agencies, Fire Departments, etc. We do not receive their particular count. So far this year, we have received notification of 75 to 80 new underground leaks, however, we are still working on old leaks that have occurred in past years and are still a problem to us.

QUESTION #10: Are there chemicals stored in underground tanks in Maryland other than petroleum products?

ANSWER #10: (DNR) There may be some, however, the vast majority of tanks that contain industrial chemicals are of the above ground type.

QUESTION #11: I believe that you are moving from secondary containment for an underground storage tank, if this is true, would you tell us why?

ANSWER #11: (DNR) Our Administration never really proposed secondary containment. The State of California proposed secondary containment, but the proposal was dropped. I believe that New York City has secondary containment in the form of vaults. I believe that tanks (other than plain steel tanks) with cathodic protection are quite secure. It is being proposed that plain steel tanks over 15 years of age and unprotected be inspected every 5 years. We feel that unprotected plain steel tanks are at risk and the Department's intention is to put in place the necessary requirements to protect Maryland citizens and the environment.

QUESTION #12: The Waste Management Administration permits and monitors hazardous and nonhazardous waste. How would the Waste Management Administration handle an application for underground storage tanks without a manhole and which contained hazardous waste material?

ANSWER #12: (WMA) Right now, we will not permit the use of an underground tank for the storage of hazardous waste materials. We would not issue a permit for it.

QUESTION #13: Is there any method for determining the thickness of the bottom of a tank that is already in service and how do we know which codes apply?

ANSWER #13: (SHAG) In an above ground tank equipped with manholes for testing tanks, an ultrasonic method will give an accurate reading. We use the standard industry code to calculate formulas for appropriate shell thickness of a storage tank. These codes are referred to in our manual. Even if a tank is not built to standard industry codes, the formulas are still used to determine the appropriate shell thickness.

QUESTION #14: Do you routinely inspect facilities? Where does Federal OSHA stop and where does State MOSH responsibility start? Would you be called in to inspect the scene of a tank failure resulting in fire or leakage?

ANSWER #14: (MOSHA) Routinely we do not get involved until an accident occurs, only after an explosion do we become involved in the construction and inspection of the tanks. Once an explosion occurs, we would be concerned if people are involved. Then we send investigators to inspect. If you are concerned as to the safety of your installation, MOSH can provide consultation and engineering services to address your concerns for safety. MOSH has the ability to enforce occupational regulations in Maryland.

QUESTION #15: If you investigate and find a company at fault, do you issue citations?

ANSWER #15: (MOSH) Yes, we do.

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QUESTION #16: We keep hearing from industry about the desireability of voluntary compliance. My experience is that voluntary compliance does not occur. I know we have good companies and we have bad companies, but what can we expect in compliance if we do not make a program mandatory?

ANSWER #16: (SHAG) We are starting out with this document as the seed for a possible program. I think we have to recognize that the Maryland Legislature has expressed its concern for the safety of toxic material containment in storage tanks. This is exemplified by the passage of House Joint Resolution 89. We are offering this document for a public comment period during which time the State will formulate its policy of how to implement a safety and containment assurance program. It could range from purely voluntary to totally mandatory.

QUESTION #17: Are there any additional questions?

ANSWER #17: None.

QUESTIONS TO THE PANEL

TANK SAFETY ASSURANCE AND CONTAINMENT SEMINAR

OCTOBER 14, 1983

Day Two

QUESTION #1: Based on knowledge and experience do you feel that groundwater monitoring is an appropriate safeguard for underground tank installations?

ANSWER #1: (Insurance Representative) From a loss control standpoint, anything you can do to detect or correct leaks is recommended. From an insurance standpoint, as it would affect premium costs, the installation of groundwater monitoring ability, you would have to discuss that with your individual insurance agent to see if there is any effect.

ANSWER CONTINUED: (DNR) There seem to be a flurry of activities as far as the increase in underground tank installations and recommendations for their proper installations. I believe that New York State has proposed a set of guidelines. New York State documents recommend various types and numbers of monitoring devices to be installed around underground facilities. They have proposed "J" tubes which go from one side under the tank and up the other side as a protection device. It is my belief that the State of California has required the installation of monitoring wells for all underground facilities. In Maryland, proposed new regulations state that at least one monitoring well be established in each new tank field. The monitoring well will be established at the center of the tank field. We think one will be adequate to detect leaks when explosion meters or other appropriate detection devices are also used. The new regulations will require one well for one new underground tank, or one well, required for each tank field will have to go at least two feet below the excavation depth of the new tank. The upper part of the well opening will have to be protected from contamination with filter screens, etc.

QUESTION #2: When will Maryland regulations on underground tanks be implemented?

ANSWER #2: (DNR) Currently, the regulations are under review by the A. G.'s Office. He has recommended extensive word changes. The regulations will then go through the normal approval procedures which include: approval by the appropriate agencies, a public comment period, publication in the Maryland Register and all the requirements for new regulation adoption. I certainly do not see new regulations being approved in final form before spring 1984.

QUESTION #3: What States do you know that require the installation of monitoring wells for underground tank facilities?

ANSWER #3: (DNR) The one I believe that has the regulations in force is California. I also believe several other States such as New York and Massachusetts are proposing that monitoring wells be included in new underground tank facilities. It is my belief that nearly all States share the concerns for leak-potential of underground facilities and are actively considering regulations with monitoring requirements.

ANSWER CONTINUED: (DNR) In regard to the earlier question as to what States have regulations in force for underground facilities, I do know that rather than entire states, certain counties within these states have appropriate regulations. For example, Suffolk County, New York and the Cape Cod area of Massachusetts, and Tampa, Florida and Philadelphia. The regulations require detection devices and underground wells as you have described.

QUESTION #4: Along the same lines, could you provide me with a copy of the proposed regulations for underground tank facilities?

ANSWER #4: (DNR) Yes, I can if you leave me your business card I will forward a copy to you.

QUESTION #5: Along the same lines of new regulations for underground facilities, will these regulations include tanks containing oil products as well as other toxic chemical products?

ANSWER #5: (DNR) As far as the Department of Natural Resources is concerned, our regulations deal only with tanks containing oil or oil products. I believe that the proposed Department of Health and Mental Hygiene regulations could possibly deal with tanks containing toxic chemical products. I am also under the belief that there are national regulations or codes that deal with underground tanks containing either oil, oil products or toxic chemical materials. Certain local jurisdictions use the appropriate BOCA codes. I do know, for instance, that the City of Baltimore requires installations to comply with the appropriate BOCA codes. I would advise you that it is not just our codes you must comply with, but rather all codes in force for your particular facilities.

QUESTION #6: How do you arrive at the tank testing frequency? That is every 5 years after 15 years in service. It is my belief that such a testing frequency would show poor corrolation with failure events.

ANSWER #6: (DNR) The reason that we started with the 15 year age is based upon our belief that the average design life of an underground facility is 18-20 years. These regulations will apply to tanks that are installed after the date of the adoption of the regulations. Additionally, the regulations will not apply to underground fiberglass tanks, coated steel tanks, and steel tanks that are cathodically protected. Any tanks that are in the ground right now, that meet the new installation requirements, will not have to be tested. For plain steel tanks in the ground right now, they will have to be tested within 2 years after adoption of the regulations. For plain steel tanks, if you do not know its age, or if you know its age, when it reaches 15 year, it will have to be tested within 2 years of the adoption of the regulations and then again every 5 years from the 2-year-test. In regard to the 5-year testing period, we want to be consistent with other testing programs which are in force. For instance, Prince George's County has a 5-year testing-frequency as do some of the other states or local jurisdications previously mentioned. It is my understanding of other state's regulations, that they require testing frequencies as often as yearly after the tanks reach 25 or 30 years of age. It is my department's belief that Precision Testing, if required on a yearly basis, could impose an economic burden on small operators. Because of these reasons, we adopted the 5-year frequency. The situation that we have now is that some jurisdictions require tests every 5 years, others require them every year and some requiring no tests at all. I personally would like to see some uniformity established for testing-frequencies.

QUESTION #7: As you described these regulations, I come to the conclusion they only apply to new construction. Do the regulations deal with insulation of tanks since these manuals describe the failure of insulated tanks as a major problem area? Do the regulations address existing insulated tanks?

ANSWER #7: (DNR) The new regulations will only apply to bare steel tanks or other tanks in meeting the installation requirements.

QUESTION #8: I have never heard the term Environmental Liability Insurance before, could someone please explain what this means and what it entails?

ANSWER #8: (Insurance Representative) Environmental Liability Insurance is something new to the insurance industry. It is a very specialized insurance dealing with liability resulting from the effects of toxic waste or toxic chemicals.

QUESTION #9: Do you know of anyone in Maryland who has this Environmental Liability Insurance?

ANSWER #9: (Insurance Representative) All I can say is that I know there are insurance companies in the State of Maryland which provide Envoronmental Liability Insurance, but I am not in a position to say which companies have purchased that insurance.

QUESTION #10: Given the situation where two tanks share the same containment device and one tank contains chemical X and the other tank contains chemical Y and they are incompatible, is this allowed under the RCRA regulations?

ANSWER #10: (EPA) There are no secondary containment devices required under RCRA regulations.

QUESTION #11: Are you saying that two tanks if containing incompatible materials, can share the same dike?

ANSWER #11: (EPA) The RCRA regulations do not address this.

QUESTION #12: If there is no diked area, then what?

ANSWER #12: (EPA) I would say that it is allowed.

QUESTION #13: Would it be permitted to store a hazardous material in a tank along side a tank containing an incompatible raw material product?

ANSWER #13: (WMA) Even though such particular situations are not addressed in the regulations, I would think that you would have to address such a situation in your overall spill containment and control plan.

QUESTION #14: Are there any further questions?

ANSWER #14: None